

The Growing Demand for Home Dialysis Therapies: Challenges and Potential Solutions

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The amendment to the Social Security Act in 1972 created a Medicare entitlement for the treatment of kidney failure, including both dialysis and transplantation, and led to an expansion of these kidney replacement therapies (KRT) in the United States. Currently, in-center hemodialysis (ICHD) is the most common KRT modality for persons with kidney failure. In 2019, 134,608 persons were newly diagnosed with end stage kidney disease (ESKD), 85% of these individuals were initiated on ICHD, and 12% were initiated on home dialysis (United States Renal Data System [USRDS], 2021). During the same year, there were 809,103 prevalent persons with ESKD, 61% of these individuals were receiving ICHD, and 13% were receiving home dialysis (USRDS, 2021). The costs of maintenance dialysis in 2019 for persons with ESKD, representing 1% of the Medicare fee-for-service population, accounted for approximately 7% of Medicare fee-for-service spending that year (USRDS, 2021).

This article presents challenges nephrology nurses and the larger nephrology community face in a changing landscape for kidney replacement therapies. New ESKD payment policies are designed to incentivize increases in home dialysis therapies. The implementation of the End-Stage Renal Disease Treatment Choices (ETC) Model is occurring amid a nursing shortage. Medicare Conditions for

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The End-Stage Renal Disease Treatment (ETC) Model, an aspect of the Advancing American Kidney Health Initiative implemented by the Centers for Medicare and Medicaid Services (CMS) in 2019, is designed to shift the predominant in-center hemodialysis dialysis model in the United States to a home dialysis model. This shift represents a monumental change in the treatment of end stage kidney failure and is occurring amid a strained nursing workforce. The CMS Conditions for Coverage for dialysis facilities mandate registered nurse responsibility for the conduct of patients' home dialysis training, and the current nursing shortage presents challenges because the need for nephrology nurses will increase to meet the growing demand for home dialysis during the ETC implementation period. As the ETC Model is implemented in randomly selected dialysis facilities across the United States, nephrology nurses must have leading roles as full partners with CMS and other stakeholders for the mutual determination of short- and long-term solutions for meeting the growing home dialysis training demands.

Key Words:

End-Stage Renal Disease Treatment Model, Advancing American Kidney Health Initiative, Centers for Medicare and Medicaid Services, Medicare Conditions for Coverage, end stage kidney failure, chronic kidney disease, patient care, home dialysis, hemodialysis, nursing shortage, patient safety, kidney replacement therapy.

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Coverage (CfC) for dialysis facilities mandate that registered nurses (RNs) conduct home dialysis training. To meet the challenge of an anticipated growing demand for home therapies, nephrology nurses must play leading roles in determining potential solutions to meet the increasing need for nephrology nursing services in home dialysis programs.

Changing Health Policy Landscape for Home Dialysis Therapies

In 2019, the Centers for Medicare and Medicaid Services (CMS) implemented the Advancing American Kidney Health Initiative with an overarching goal of improving the lives of Americans with kidney disease by expanding treatment options and reducing health care costs (Federal Register, 2019). One aspect of this initiative is the ETC Model, a payment model that encourages greater use of home dialysis and preemptive kidney transplantation for Medicare beneficiaries with ESKD (Federal Register, 2020). CMS selected dialysis facilities and managing clinicians as mandatory participants in the ETC Model based on randomly selected geographic locations to account for approximately 30% of dialysis facilities in the United States (CMS, 2022b). Under the ETC Model, CMS increases certain Medicare payments for home dialysis and dialysis-related services to participating dialysis facilities and managing clinicians from January 1, 2021, through June 30, 2027 (CMS, 2020). This new policy is designed to shift the predominant ICHD model to a home dialysis model. While CMS has not projected the anticipated growth in home dialysis therapies during the 6-year payment incentive period, the agency will conduct a robust evaluation of the ETC Model to determine whether the payment adjustments for dialysis facilities and managing clinicians will improve the uptake of home dialysis and transplantation, reduce Medicare expenditures, and preserve or enhance the quality of care for ESKD Medicare beneficiaries (CMS, 2020).

Kidney care is highly regulated with Medicare as the primary payer for a majority of persons receiving maintenance dialysis. Since the inception of the End-Stage Renal Disease (ESRD) Medicare benefit, attempts to control costs have included the introduction of bundled payments and the introduction of quality metrics for ESKD and non-dialysis chronic kidney disease (CKD) care (Mendu & Weiner, 2020). These quality metrics are linked to payment. It is anticipated that a home dialysis quality measure will be incorporated into the ESRD Quality Incentive Program (QIP). The QIP reduces payments to dialysis facilities that do not meet or exceed certain performance standards on applicable measures (CMS, 2022a).

The Kidney Care Quality Alliance (KCQA), a quasi-independent sister organization to Kidney Care Partners (KCP), develops performance measures specifically for use in the federal ESKD quality programs. In response to the QIP, KCQA launched a new project cycle to develop performance metrics to include home dialysis (KCQA, 2022),

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and proposed quality measures for home dialysis have been developed and sent to the National Quality Forum for consideration for endorsement. The development of financial incentives and quality measures to incentivize dialysis facilities to move individuals to home therapies have led to efforts by members of the kidney community and key stakeholders to determine how to meet those demands.

Unfortunately, nephrology nurses are not always invited to participate in these efforts, discussions, or determinations. Examples include a recent position statement by Innovate Kidney Care (IKC, 2022) and a bill introduced into Congress entitled *Improving Access to Home Dialysis Act*, which propose alternative ways of providing home dialysis and training, suggesting the use of persons other than RNs, including vendor representatives, and settings other than certified dialysis facilities, as well as payment for staff who would assist with home dialysis.

Role of the RN in Home Dialysis

Medicare Conditions for Coverage: RN Requirements for Home Training

A requirement for home dialysis programs, as stipulated in the 2008 CMS CfC for dialysis facilities, is that an RN has primary responsibility for training persons for home therapies.

The existing requirement mandates that an RN must conduct home training. We believe that an RN, as an experienced health professional, fully understands the complexity and rationale for the dialysis process and is the best-suited expert to conduct self-care training for patients. The requirement serves to protect the health and safety of the patient. The RN may use other members of the clinical dialysis staff to assist in providing the home training. (Federal Register, 2008, p. 20410)

Individual State Nurse Practice Acts define specific functions for RNs and licensed practical/vocational nurses (LPNs) and address what RNs can delegate, to whom, and under what circumstances. The CfC RN mandate for home training is consistent with the American Nurses Association's (ANA) and the American Nephrology

Nurses Association's (ANNA) *RN Scope and Standards of Practice* (see Boxes 1 and 2) (ANA, 2021a; ANNA, 2017). The National Council of State Boards of Nursing (NCSBN) and the ANA provide *National Guidelines for Nursing Delegation* that stipulate the decision about whether or not to delegate or assign is based upon the RN's judgment concerning the condition of the patient, the competence of all members of the nursing team, and the degree of supervision that will be required of the RN if the task is delegated (NCSBN & ANA, 2019). In line with these delegation guidelines, ANNA's formal position on RN's delegation of nursing care activities specifies that:

...the RN uses critical thinking and professional judgment when following the Five Rights of Delegation, to be sure that the delegation or assignment is the *right* task, under the *right* circumstances, to the *right* person, with the *right* directions and communications, under the *right* supervision and evaluation. (ANNA, 2020, p. 1)

The ANNA (2020) position statement also stipulates that:

...the RN must never delegate a nursing care activity that requires 1) the knowledge and expertise derived from the completion of a nursing education program and the specialized skill, judgment, and decision-making of a registered nurse; 2) complex observation, critical decision-making, exercise of nursing judgment, or repeated nursing assessments; and 3) an understanding of the core nephrology nursing principles necessary to recognize and manage real or potential complications that may result in an adverse outcome to the health and safety of the patient. (p. 1)

Clearly, short- and long-term solutions for the role of the nephrology nursing workforce in meeting the demands of a growing home dialysis population must be consistent with the scope of practice and delegation regulations for RNs.

Impact of the Registered Nurse on Individuals Receiving Dialysis Therapies

Research conducted on samples of nurses working in ICHD units reveal the important impact that adequate RN staffing, reasonable RN workloads, and completion of care processes by RNs can have on reducing patient adverse events and improving dialysis unit safety. For example, in a study that examined the effect of RN staffing and missed nursing care on nurse-reported adverse patient events in ICHD units, findings revealed that RNs working with high patient-to-RN ratios (i.e., low RN staffing) and increased occurrences of missed care by RNs were significantly more likely to report increased occurrences of dialysis hypotension, skipped and shortened dialysis treatments, and

Box 1 ANA Scope and Standards of Practice

1. Scope of practice describes the services that a qualified health professional is deemed competent to perform, and permitted to undertake – in keeping with the terms of their professional license.
 - a. The Nursing Scope and Standards of Practice describe the “who,” “what,” “where,” “when,” “why,” and “how” of nursing practice:
 - i. Who: Registered Nurses (RNs) and Advanced Practice Registered Nurses (APRNs) comprise the “who” constituency and have been educated, titled, and maintain active licensure to practice nursing.
 - ii. What: Nursing is the protection, promotion, and optimization of health and abilities; prevention of illness and injury; facilitation of healing; alleviation of suffering through the diagnosis and treatment of human response; and advocacy in the care of individuals, families, groups, communities, and populations.
 - iii. Where: Wherever there is a patient in need of care.
 - iv. When: Whenever there is a need for nursing knowledge, compassion, and expertise.
 - v. Why: The profession exists to achieve the most positive patient outcomes in keeping with nursing's social contract and obligation to society.

Source: American Nurses Association, 2021.

Box 2 ANNA Scope of Nursing Practice

Optimal individual physical and cognitive function and family support throughout all phases of disease management are the primary goals of nephrology nursing. The nephrology nurse achieves these primary goals by diagnosing and treating human responses exhibited by individuals and families with kidney disease or who are at risk for developing chronic kidney disease. These human responses include, but are not limited to, physical symptoms, functional limitations, psychosocial disruptions, and knowledge needs.

Treatment of these responses involves health promotion and disease prevention counseling, health maintenance education, psychosocial support to build or sustain coping capacity, education to encourage active participation in decision-making and self-care, restorative physical care to manage disease and treatment-related symptoms, and the delivery of kidney-replacement therapies, including transplantation.

Source: American Nephrology Nurses Association, 2017.

Individuals preferred home dialysis over center-based treatment when increased RN support was available.

patient complaints in their units compared to RNs working with low patient-to-RN ratios (i.e., high RN staffing) and no occurrences of missed care (Thomas-Hawkins et al., 2008). In a recent study, the impact of RN staffing, RN workload, and missed nursing care on RN ratings of patient safety in ICHD units was examined (Thomas-Hawkins et al., 2020). Findings revealed that RNs working with high patient-to-RN ratios, high workloads, and increased occurrences of missed care were significantly more likely to report unsafe patient shift change safety and low overall patient safety in their dialysis units, compared to nurses working with low patient-to-RN ratios, low workloads, and no occurrences of missed care.

In addition, a study by Chen and colleagues (2019) analyzed the impact of dialysis facility staffing on unplanned 30-day hospital readmissions over a three-year period (2010-2013), using patient data from the USRDS and CMS Medical Evidence forms, and dialysis facility staffing data abstracted from ESRD facility surveys. The researchers found that dialysis facilities with significantly worse 30-day hospital readmission rates had lower proportions of nurses (RNs and LPNs) to total staff and higher patient-to-nurse ratios (Chen et al., 2019). The extent to which home dialysis RN staffing, workload, practice environment support, and limitations on available space for home dialysis training have an important impact on home dialysis program outcomes is not known, and there is an urgent need for research on these areas.

Similar to the impact of the nurse on persons receiving ICHD, the partnership between the RN and the individual receiving home dialysis therapy is both critical and complex. The time spent during the initial training, the teaching process, and the teacher is crucial for home therapy success (Baillie & Lankshear, 2015; Doss et al., 2011). Several research reports highlight the essential role of the nurse in home dialysis training programs. A study by Walker and colleagues (2018) highlighted the key role of RN support in dialysis modality decisions by persons requiring KRT. Walker and colleagues (2018) examined attributes of dialysis care that had an impact on dialysis KRT modality decisions by persons with ESKD. Their findings revealed that these individuals preferred home dialysis over center-based treatment when increased RN support was available. Similarly, in a study that examined the teaching-learning partnerships between RNs and persons receiving home peritoneal dialysis (Radmore & Hykräs, 2019), all patient participants in the study reported that the attentive care and information they received from the RN were critically important. RN participants in the study reported using repetition of basic instructions, customized education, a hands-

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on approach, and periodic re-training with short quizzes to reinforce learning. Another study aimed at identifying common features in an RN-led automated peritoneal dialysis training program in six high-performing peritoneal dialysis centers with high retention and low infection rates reinforced the critical role of the nurse in the provision of home training that employed adult learning techniques grounded in adult learning theory (Firaneek et al., 2013). The researchers for this study concluded that favorable

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The importance of RN-led training is also evident in non-ESKD clinical scenarios that require individuals to competently execute self-care skills. For example, a meta-analysis of RN-led diabetes self-management education programs revealed that RN-led education was associated with improved glycemic control and cardiovascular risk factors (Tshiananga et al., 2013). Similarly, a RN-led caregiver pediatric home parenteral nutrition training program led to a reduction in central line-associated bloodstream infection rates from 3/1000 catheter days to 0.8/1000 catheter days and a reduction in 30-day rehospitalization rates from 40% to 28% (Gallotto et al., 2019). These studies support CMS's requirement that RNs be responsible for home dialysis training. Specifically, RNs have the education and experience to fully understand the complexity of the dialysis process and are the best-suited expert to conduct dialysis self-care training. As noted in the CfC, the RN requirement serves to protect the health and safety of the patient (Federal Register, 2008).

Nursing Shortage and Workforce Challenges

The national nursing shortage is a concern because the need for nephrology nurses will increase to meet the anticipated growing demand for home dialysis therapies. Before the COVID-19 pandemic, the nursing shortage was pro-

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jected to continue through 2030 for multiple reasons, including the retirement of Baby Boomer nurses from the workforce, persistent insufficient RN staffing, and unsupportive work environments that contribute to job stress, reduced job dissatisfaction burnout, and job exit (American Association of Colleges of Nursing [AACN], 2020; Buerhaus et al., 2017; National Academies of Sciences, Engineering, & Medicine, 2021). Additionally, inadequate nursing school enrollments to meet projected demands for nursing services and faculty shortages that restrict nursing program enrollments are academic institutional factors contributing to the nursing shortage (AACN, 2020; Bureau of Labor Statistics, 2021). The COVID-19 pandemic has exacerbated the shortage due to RNs' physical and emotional exhaustion and psychological and moral distress (ANA, 2021b; Carey et al., 2020; Turale & Nantsupawat, 2021). Notably, in a survey distributed to nephrology nurses during the COVID-19 pandemic, 62% of respondents reported feeling burned out from work, and 47% reported symptoms of anxiety (Montoya et al., 2021).

The shortage of RNs in the nephrology workforce was a concern that ANNA raised with CMS when the ETC Model was proposed (ANNA, 2019). ANNA cautioned that the proposed mandatory ETC payment model that would move more persons with ESKD from ICHD to home dialysis represented a monumental change in the treatment of ESKD and highlighted the need for a qualified nursing workforce to appropriately train, educate, prepare, and support these individuals and their care partners for home therapies. Assuredly, addressing the current shortage of nephrology nurses is no small matter in light of the increasing demand for home dialysis and the requisite patient training.

Short- and Long-Term Solutions

Possible solutions for meeting the demands for increased RN services due to an anticipated growth in home dialysis therapies include a broadening of the home dialysis training team, implementation of strategies designed to increase the retention of nephrology nurses in dialysis facilities, and addressing root causes of the nursing shortage in nephrology settings.

While the CfC requires a qualified home training RN to assume responsibility for the training and support of individuals who choose home therapies, CMS does not prohibit the use of other members of the health care team in these processes. In the past, the small number of patients on

home therapies and the preponderance of small home therapy programs (e.g., 5 to 8 patients) meant there was no impetus to enlist additional staff members in the home program. With the current push for an increase in home therapies, it has become increasingly apparent that a broader mix of staff is needed. In line with current regulations, the clinical team, including dietitians, social workers, advanced practice registered nurses, physician assistants, and ancillary staff, can comprise a broader home training team for which the RN has oversight and delegation responsibilities. In addition, dialysis device manufacturers are needed to train dialysis staff only, not patients, in the use of home dialysis machines and equipment who, in turn, will train patients. Of note, ANNA has developed a Home Dialysis Therapies Task Force to gather and analyze information on the role of the nephrology nurse for home dialysis therapies and to clarify nurse-specific tasks versus tasks that may be delegated to support staff. The Home Dialysis Therapies Task Force will also analyze barriers and opportunities of home therapies that impact individual success.

Increased retention of nephrology nurses is urgent. Addressing the current fatigue and psychological distress nurses are experiencing is imperative. Moreover, an immediate review of existing home and ICHD dialysis work environment factors contributing to the nursing shortage and RN attrition is warranted. RN staffing practices, regular and on-call schedule balances, overtime policies, the quality of staff training, and the availability of RN mentors and preceptors for new staff should be assessed and problem areas addressed. Consideration should also be given to prioritizing new RN hires for ICHD units and migrating seasoned nurses from ICHD to home dialysis programs. Additionally, the impact of the ETC Model on decreases in the ICHD population, and RN staffing needs in HD units should be routinely evaluated during the payment model incentive period.

Longer-term solutions are also needed to address the root causes of the nephrology nursing shortage. Modifiable factors that contribute to the nephrology nursing shortage are similar to factors in the larger U.S. nursing workforce, including low RN staffing, high RN workloads, unsupportive dialysis work environments, and burnout (Flynn et al., 2009; Montoya et al., 2021; Thomas-Hawkins et al., 2020; Ulrich & Kear, 2018). Improving RN staffing, workloads, and other work environment factors that enable professional nursing practice are necessary long-term solutions.

For home dialysis therapy programs, formal instructional programs that provide a solid basis for skill sets needed for the nephrology RN to become competent in home dialysis training provide an ideal foundation for nurses entering this specialty (Mitra et al., 2015). In addition, recent systematic reviews of nurse residency programs for new graduate RNs reveal improved retention and greater satisfaction with orientation to the professional role and practice setting (Asber, 2019; Van Camp & Chappy, 2017). The creation of residency programs for nurses new to the nephrology specialty in which nurses are assigned to long-term RN preceptors (e.g., one year) should be considered in efforts to retain

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newly hired nurses in dialysis settings. Moreover, student nurse externships and clinical rotations in dialysis units would enable early exposure to nephrology nursing and pique students' career interest in the specialty (Rugs et al., 2020; Sauder et al., 2012).

Dialysis provider organizations can also 'build their own' new RN supply through the support of dialysis technicians' enrollment in RN education programs funded internally or by the Human Resource Services Administration's Title VIII Nursing Workforce Development program.

Efforts should also be undertaken to support the first goal of the AAKHI, which is to reduce the risk of kidney failure by targeting a reduction of the number of Americans with ESKD by 25% by 2030. The U.S. Department of Health and Human Services (HHS) Advancing American Kidney Health: 2020 Progress Report indicates there have been great strides in this area (HHS, 2020). In this report, HHS notes that these efforts include increasing public awareness about kidney health and supporting and empowering individuals living with chronic kidney disease (CKD). Moreover, a voluntary payment model, Kidney Care Choices (KCC), builds upon the existing Comprehensive ESRD Care (CEC) Model structure and adds financial incentives for health care providers to manage the care of Medicare beneficiaries with CKD stages 4 and 5 (CMS, 2022c). This model is designed to delay the onset of dialysis and incentivize kidney transplantation, thus decreasing the need for dialysis-related services and the demand for nephrology nurses.

Conclusion

The dialysis treatment landscape is changing, and the new ETC payment model has increased the demand for home dialysis therapies and the requisite RN leadership and care. The role of the RN in home dialysis therapies is unique and requires a special skillset (Peters, 2013). Mitra and colleagues (2015) noted that the essential qualifications for nurses leading home dialysis programs include a sound knowledge of dialysis combined with effective teaching skills, a strong belief and value about self-care and the benefits of home dialysis, the ability to work independently, excellent communication skills, an understanding of adult learning principles, the ability to communicate sensitively with patients and their families, and organizational and leadership skills.

The growth of home dialysis together with the shortage of nephrology nurses presents a challenge that requires immediate attention. Undoubtedly, nephrology nurses must be at the table and have leading roles as full partners with CMS and other stakeholders for the mutual determination of short- and long-term solutions for meeting the growing home dialysis training demands. As noted in ANNA's response to the proposed rule for the ETC model (ANNA, 2019), nephrology nurses are adaptable and forward-thinking, and they have historically found a way to provide the highest quality care for their patients regardless of the circumstances and constraints. Past experiences have shown that seeking nurses' input and providing a key role for them in the development of new policies and solutions will enhance their timely execution.

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continued on page 120

Home Dialysis Therapies

continued from page 115

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